

Serial No.: 10/605,622  
Art Unit: 3747  
Examiner: HUYNH, Hai H.  
Page 2 sur 7

**IN THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A method of optimizing idle speed for a fuel injected engine comprising the steps of:  
determining instantaneous current requirements of electronics of a watercraft;  
from the instantaneous current requirements, determining a minimum engine speed necessary to drive a battery charging device of the watercraft; and  
adjusting, on-the-fly, idle speed of the fuel injected engine to the minimum engine speed.
2. (Original) The method of claim 1 wherein the step of determining instantaneous current requirements of electronics of the watercraft at idle further includes the step of acquiring current feedback data from a plurality of current sensors operationally connected to the electronics.
3. (Original) The method of claim 1 further comprising the step of determining a charge level of a battery of the watercraft.
4. (Original) The method of claim 3 wherein the step of determining a minimum engine speed includes the step of isolating an engine speed sufficient to drive the battery charging device to charge the battery given the instantaneous current requirements of the electronics and the battery charge level.
5. (Original) The method of claim 4 further comprising the step of comparing the instantaneous current requirements of the electronics and charging output of the battery charging device with a predetermined map of data to determine the minimum engine speed.
6. (Original) The method of claim 1 further comprising the step of adjusting the idle speed to a level sufficient to drive the battery charging device such that a charge level of a battery of the watercraft remains above a predetermined charge level.

Serial No.: 10/605,622  
Art Unit: 3747  
Examiner: HUYNH, Hai H.  
Page 3 sur 7

7. (Original) The method of claim 1 wherein the electronics include at least one of an ECU, lights, live well aerators, pumps, fuel injectors, and alternator.
8. (Original) An outboard motor comprising:
  - an internal combustion engine;
  - an alternator driven by the engine and connected to charge a battery;
  - an idle speed controller connected to the engine and configured to adaptively set an idle speed of the engine; and
  - an ECU to instruct the idle speed controller to set an idle speed of the engine based on instantaneous power requirements on the battery.
9. (Original) The outboard motor of claim 8 further comprising a plurality of current sensors connected to provide feedback to the ECU of instantaneous current requirements of a plurality of auxiliary devices.
10. (Original) The outboard motor of claim 8 wherein the ECU further includes memory having stored therein a predefined curve representing alternator output versus idle engine speed data.
11. (Original) The outboard motor of claim 10 wherein the ECU is further configured to determine idle speed from the predefined curve based on the instantaneous power requirements.
12. (Original) The outboard motor of claim 8 wherein the ECU is further configured to determine idle speed to prevent voltage of the battery from falling below a predetermined level.
13. (Original) The outboard motor of claim 8 wherein the ECU is further configured to determine an idle speed for warm-up conditions of the engine that is independent of the instantaneous power requirements.
14. (Original) The outboard motor of claim 8 wherein the ECU is further configured to instruct the idle speed control to set the idle speed of the engine to a level minimally sufficient to run the engine and satisfy the instantaneous power requirements.

Serial No.: 10/605,622  
Art Unit: 3747  
Examiner: HUYNH, Hai H.  
Page 4 sur 7

15. (Original) The outboard motor of claim 8 wherein the internal combustion engine has at least one fuel injector in direct communication with a cylinder of the internal combustion engine.
16. (Original) A computer readable storage medium having stored thereon a computer program to adaptively regulate engine idle speed, the computer program having a set of instructions that when executed by a processor cause the processor to:
- determine an instantaneous battery voltage level of a battery configured to supply power to an engine;
  - determine instantaneous power requirements of the engine; and
  - based on the instantaneous battery voltage level and the instantaneous power requirements, determine an engine idle speed.
17. (Original) The computer readable storage medium of claim 15 wherein the set of instructions further causes the processor to determine the engine idle speed from a map of predefined values stored in a memory accessible by the computer.
18. (Original) The computer readable storage medium of claim 15 wherein the set of instructions further causes the processor to set engine idle speed to a level sufficient to drive a battery charging device such that the instantaneous battery voltage remains above a predetermined level.
19. (Original) The computer readable storage medium of claim 15 wherein the set of instructions further causes the processor to set idle speed to a speed lower than that needed when the battery is not fully charged and the instantaneous power requirements of the engine is below a predetermined level.
20. (Original) The computer readable storage medium of claim 18 wherein the set of instructions further causes the processor to set the idle speed to below 500 RPM.
21. (Original) The computer readable storage medium of claim 15 incorporated in an ECU of an outboard motor having a direct injected engine.